查询RF5609ANB-011供应商

Description

The Reticon RF5609A is a seven-pole, six-zero elliptic low-pass filter with over 75 dB out-of-band rejection and less than ±0.5 dB of passband ripple. The pinout configuration for this device is shown in Figure 1, and the package dimensions are given in Figure 6.

The RF5609A is a monolithic, switched-capacitor filter fabricated in a double-poly NMOS process.

Note: These are MOS devices. Although static protection has been built into them MOS handling procedures should be followed.

Key Features

- Easy to use
- No external components required
- Small size: 8-pin mini-DIP
- Wide power supply range: ±5V to ±10V
- Dynamic Range: 75 dB, typical
- Corner Frequency Range: 10 Hz to 25 kHz
- Insertion loss: 0 dB, typical

Typical Applications

- Antialias filters
- Reconstruction filters
- Tracking filters
- Audio analysis
- Telecommunications
- Portable instrumentation
- Biomedical/Geophysical instrumentation
- Speech processing

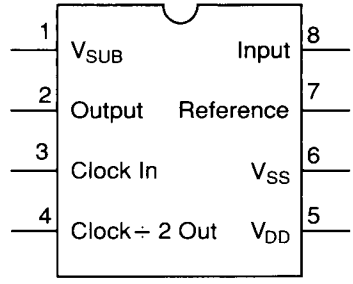

Figure 1. Pinout Configuration

Device Operation

The RF5609A is self-contained and requires only an external clock trigger (either TTL or CMOS) and power supplies. The device characteristic and operating parameters were obtained using the test configuration shown in Figure 2.

In applications where DC information must be passed through the filter, the output offset may be nulled out by varying the reference voltage. This will change the input trigger level and may require adjustment of clock voltage values. The reference input requires less than 100 µA of current and must always be well-filtered. A circuit that may be used to remove the output offset is shown in Figure 2.

A divided-by-two clock output is also available. This output provides a square wave at the sample rate (sample rate = f_S = $f_C/2$) and may be used for triggering, summing out the sample rate residue, or driving additional filters, especially when filtering requirements are spaced by an octave.

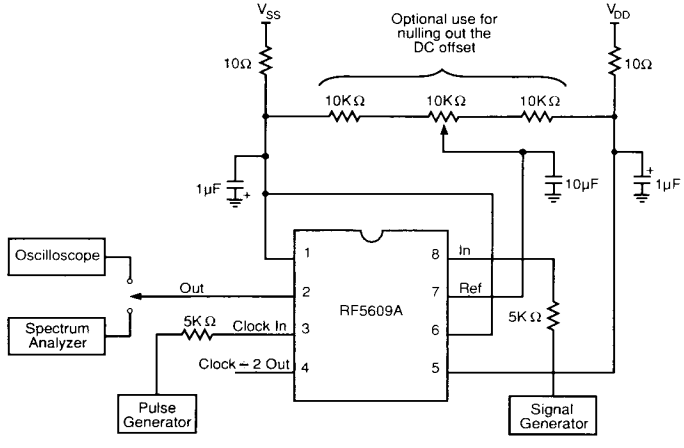

Figure 2. Test Circuit

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Pre/Post Filtering Considerations

The typical sampling rate on the RF5609A is 50 times the corner frequency. (Note: Sampling rate = 1/2 input clock trigger rate.) Because the sample rate will be far from the frequencies of interest in most cases, antialiasing filtering will usually not be required. However, as with all sampling systems, frequencies or noise above half the sample rate will be aliased and may appear in the band of interest. If this is the case, an external antialiasing filter will be required on the input. A one- or two-pole Butterworth low-pass filter will usually suffice. An unstable clock frequency can also produce the effect of an aliased signal. In applications where sampling residue may affect system performance, a single-pole RC filter may be added to the output.

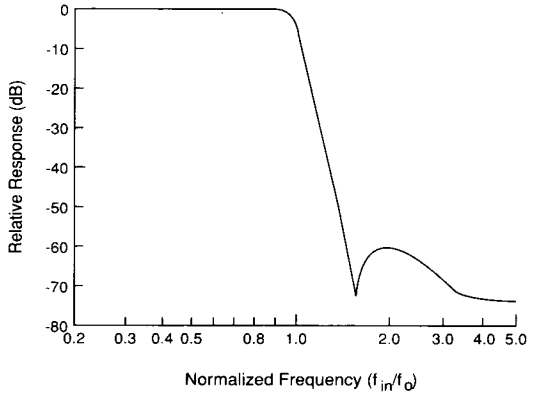

Figure 3. Magnitude Response

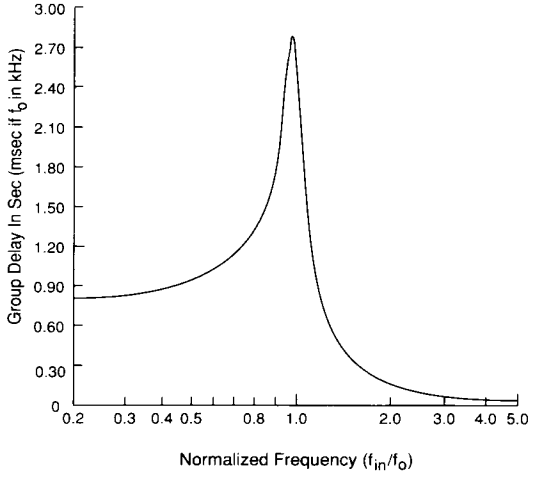

Figure 4. Group Delay

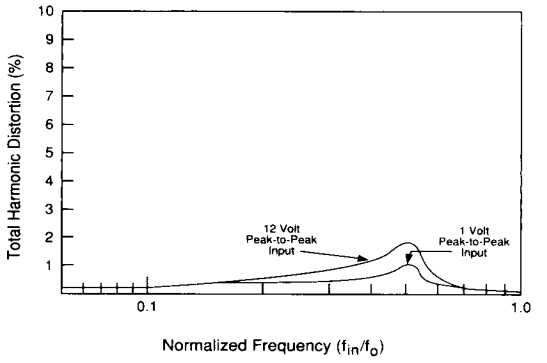

Figure 5. Typical Total Harmonic Distortion

Table 1. Absolute Minimum/Maximum Ratings

	Min	Max	Units
Input voltage - any terminal with respect to substrate, pin 1 (V_{SS})	-0.4	21	V
Output short-circuit duration - any terminal	Indefinite		
Operating temperature	0	70	°C
Storage temperature	-55	125	°C
Lead temperature (soldering, 10 sec.)		300	°C

Caution: Observe MOS handling and operating procedures

Note: This table shows stress ratings *exclusively*. Functional operation of this product under any conditions beyond those listed under standard operating conditions is not suggested by the table. Permanent damage may result if the device is subject to stresses beyond these absolute min/max values. Moreover, reliability may be diminished if the device is run for protracted periods at absolute maximum values.

Although devices are internally gate-protected to minimize the possibility of static damage, MOS handling precautions should be observed. Do not apply instantaneous supply voltages to the device or insert or remove device from socket while under power. Use decoupling networks to suppress power supply turn-off/ on switching transients and ripple. Applying AC signals or clock to device with power off may exceed negative limit.

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Table 2. Device Characteristics and Operating Range Limits [1]

Parameter	Conditions & Comments	Sym	Min	Typ	Max	Units
Supply voltages		V_{DD}	+5		+10	V
		V_{SS}	-5		-10	V
Quiescent current [3]	No load	I_Q		16	21	mA
Clock frequency	$f_c = 2(f_s)$	f_c	1		2500	kHz
Clock pulse width		T_{cp}	200		$(10^9/f_c)$-200	nsec
Input clock levels		V_{IL}	V_{SS}		0.8	V
		V_{IH}	3.0		V_{DD}	V
Maximum output signal [2]	V_{in} = 4 V_{rms}	V_o	3.8			V_{rms}
Clock to corner freq. ratio		f_c/f_o	97	100	105	
Corner frequency [2]		f_o	0.01		25	kHz
Input impedance(s)		R_i		10		MΩ
		C_i			15	pF
Load impedance(s)		R_L	10			KΩ
		C_L			50	pF
Dynamic output impedance	Small signal	R_o		10	250	Ω

Notes:

[1] V_{DD} = +10V, V_{SS} = -10V, f_c = 500 kHz, T = 25°C, V_{in} = 4 V_{rms} at 1 kHz
[2] Performance degrades at temperatures above 25°C
[3] Increases 15% for operation at 0°C

Table 3. Performance Standards [1]

Parameter	Conditions & Comments	Sym	Min	Typ	Max	Units
Output noise		e_n			2.5	mV_{rms}
Dynamic range [2]		DR	70	75		dB
Total Harmonic Distortion		THD			3	%
Insertion loss [2]			-0.4		0.4	dB
Clock feedthrough				30	60	mV_{rms}
Ripple			-0.2		0.2	dB
DC offset voltage [2]			-0.8	0.1	0.8	V

Notes:

[1] V_{DD} = +10V, V_{SS} = -10V, f_c = 500 kHz, T = 25°C, V_{in} = 4 V_{rms} at 1 kHz
[2] Performance degrades at temperatures above 25°C

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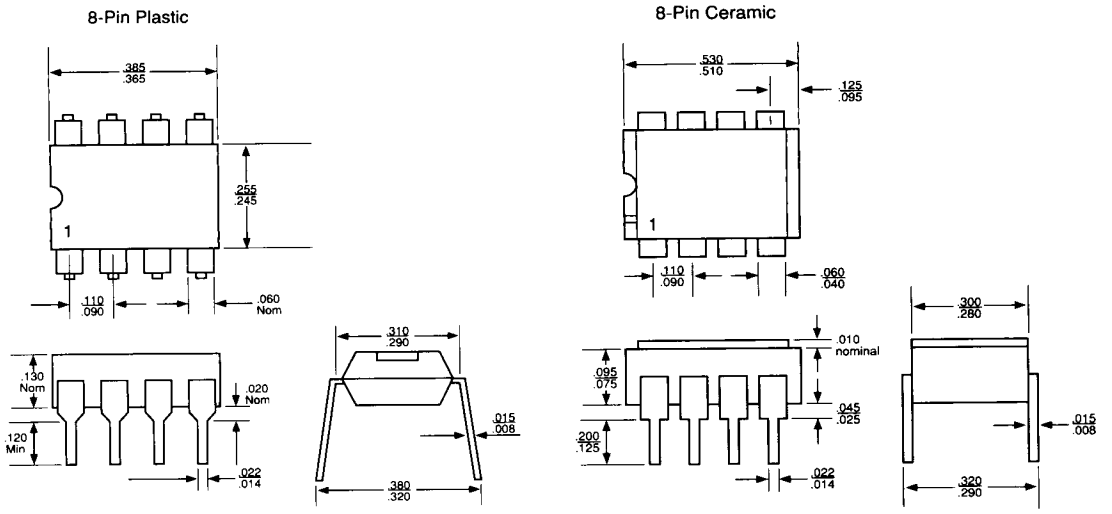

Figure 6. Package Dimensions

Ordering Information

Part Number	Description
RF5609ANP-011	7-pole elliptical low-pass filter, 8-pin plastic package
RF5609ANB-011	7-pole elliptical low-pass filter, 8-pin ceramic hermetic package
RF5609ANP-012	7-pole elliptical low-pass filter, 8-pin plastic package, 100% screened at 0°C, 25°C, and 70°C

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